

REMARKS

Claims 1 to 16 are pending. Claims 1, 8 and 10 have been amended. Support for amended claims 1 and 10 is found in the published application, for example, at Paragraphs [0068]-[0075]. Claim 8 is amended to correct the alternative language in the claim. No new matter has been added.

Claim rejections under 35 U.S.C. § 112, second paragraph (Office Action p. 2)

Claims 7 is rejected as indefinite with regards to the term “plate-like.” Applicants respectfully assert that the term “plate-like” is not indefinite and is fully defined in the specification. Indeed, Paragraph [0063] describes “a plate-like inorganic filler such as talc, mica, glass flake, montmorillonite and smectite” and defines the filler as preferably having “an average length of 1 to 80 μm , more preferably 1 to 50 μm , and an average aspect ratio (length/thickness) of 2 to 60, more preferably 10 to 40.”

Claim 8 is rejected as indefinite with regards to the alternative language. Claim 8 has been amended making the rejection now moot.

In light of the arguments and amendments made herein, Applicants respectfully request reconsideration and withdrawal of the rejections under 35 U.S.C. § 112, second paragraph.

Claim rejections under 35 U.S.C. § 103a (Office Action p. 3, 4)

Claims 1-3 and 5-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over United States Patent No. 6,124,004 to Furuta et al. (the ‘004 Patent).

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over the ‘004 Patent in view of United States Patent No. 5,891,532 to Furuta et al. (the ‘532 Patent).

The rejection alleges that the ‘004 Patent teaches a laminate of liquid crystal polymer resin with metallic foil wherein the LCP resin comprises a LCP and a rubber having a functional group reactive with the LCP. The Examiner further alleges that the ‘004 Patent teaches that the function rubber is preferably a (meth)acrylate-ethylene-unsaturated carboxylic acid glycidyl ester and/or

unsaturated glycidyl ester copolymer rubber having an ethylene content of preferably more than 3wt% but less than 50wt%. Finally, the rejection alleges that the '532 Patent provides a similar LCP resin but with an ethylene value of 50-99.9% by weight to provide a particular stiffness modulus. It is alleged that it would be obvious to one of skill in the art that utilizing values just above the preferred range would be suitable, particularly in light of the '532 Patent, in order to optimize the desired end properties of the resin.

Applicants respectfully note that the '004 Patent is limited to a laminate comprising a metallic foil and a layer made of liquid crystal polymer. That is to say, a *metallic foil is laminated (by heat-press bonding)* onto the surface of the polymer on the substrate. The '004 Patent specifically gives preference to the addition of an adhesive layer interposed between the liquid-crystal polymer resin and the metallic foil (Column 12).

Applicants note that, according to the instant invention, prior to formation of metal layer, the substrate is subjected to collision with cations by plasma-treatment (Paragraph [0069]). This plasma-treatment enables the substrate to have a high affinity for metal via a polar group (nitrogen or oxygen). The metal films are then successively deposited onto the plasma-treated substrate without exposure to air (Paragraph [0071]). This process assures a high adhesion between the metal layer and the substrate.

The use of nitrogen plasma enables the reduction of desorption of carbon dioxide gas resulting from a breakage of the ester bonding of the resin substrate, thereby avoiding deterioration in strength of the surface portion of the resin substrate (Paragraph [0070]). Without plasma treatment, a substrate is provided with no chemical bonding to metal layer, thereby having no metal affinity, i.e. the peel strength nearly equals zero.

Furthermore, according to the instant invention in Paragraph [0075] of the published specification:

a particularly high adhesion strength of the metal layer can be achieved by using the resin composition of the present invention, performing the heat treatment and the

plasma treatment as the pretreatments, and forming the metal layer by the PVD method such as sputtering. That is, by an effect of implanting high-energy metal particles into a surface portion of the resin substrate during the PVD method, and *a chemical modification effect* brought by the plasma treatment in addition to the heat-treatment effect, it is possible to obtain *a strong chemical bonding at the interface between the resin substrate and the metal layer without using adhesive agents and chemicals*. (emphasis added).

As such, Applicants have amended Claims 1 and 10, from which claims 2-9 and 11-16 depend, to recite that said metal layer is formed by physical vapor deposition of a metal onto said substrate and said substrate is treated with plasma prior to formation of said metal layer.

Nothing in the '004 Patent or in the '532 patent teaches or suggests the use of physical vapor deposition or the use of plasma treatment. As such, one of ordinary skill in the art would have had no reasonable expectation of success in achieving the results of the instant invention based on the teachings of the '004 Patent alone, or in combination with the '532 patent.

Accordingly, Applicants respectfully contend that none of Claims 1-16 would have been obvious to a skilled person in the art over the cited references because of claimed chemical differences. Accordingly, Applicants respectfully request reconsideration and withdrawal of all rejections under 35 U.S.C. § 103.

Double Patenting (Office Action Page 5).

Claims 1-16 are provisionally rejected on the grounds of nonstatutory obviousness-type double patenting over Claims 1, 5, 7, 8 and 10-19 of copending Application No. 10/591,865 (the '865 Application)

Without conceding the validity of the Examiner's rejection, Applicants respectfully request that this provisional rejection be held in abeyance until allowance of the instant claims, but for the obviousness-type double-patenting rejection.

Applicant believes that no additional fees, other than the fee for the one-month extension of time, are required in connection with this paper. Nevertheless, Applicant authorizes the Director to charge any deficiency in the fees filed, asserted to be filed or which should have been filed herewith (or with any paper hereafter filed in this application by this firm) to Deposit Account No. 04-1105, under Order No. 80079(302721).

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